REMARKS/ARGUMENTS

The application has been amended to be in condition for allowance.

Claims 1-5, 8-11, 13-14, and 27-40 are present, claim 12 being cancelled.

The Official Action objected to claim 11 and rejected claims 11-14 under §112, second paragraph, as indefinite.

Claim 11 has been amended as kindly suggested by the Examiner, and as to remedy the stated bases of objection/rejection. Accordingly, withdrawal of the objection/rejection is solicited.

The Official Action rejected claims 1, 3, 8, 10, and 30-31 under §102 as anticipated by AOKI et al. 6,229,188.

The Official Action rejected claims 11-13 under §102 as anticipated by SASE (JP406021451A).

The Official Action rejected claims 2, 4, 12, 27, 32, and 38-40 under §103 over AOKI et al. in view of VO et al. 5,424,226.

The Official Action rejected claim 5 under §103 in view of AOKI et al. and VO et al., and further in view of SASE.

The Official Action rejected claim 9 under §103 in view of AOKI et al. and VO et al. in further view of WOLF (ISBN 0-961672-4-5).

The Official Action rejected claim 14 under §103 over SASE and AOKI et al.

The Official Action rejected claims 28-29 under §103 in view of SASE and WOLF and COE 4,939,390.

The Official Action rejected claims 33-36 under §103 in view of SASE, WOLF, and COE.

The Official Action rejected claim 37 under §103 in view of SASE, WOLF, COE and BURR et al. 5,622,880.

Consider AOKI et al. first.

Claim 1 recites a channel region of a first conductivity type in a semiconductor region of a second conductivity type, the channel region underlying a gate insulating film.

The Official Action offers AOKI et al. Figure 1B for showing regions 2A and 2B. Region 2A is said to be a channel region of a first conductivity type and underlying a gate insulating film 2B.

In Figure 1B, region 2A is a channel region. Column 2, lines 20-40 indicate that region 2A is an epitaxial growth layer having an impurity doping concentration lower than that of the substrate 1. There is no disclosure that the impurity type is different from that of substrate 1. Claim 1 requires that the channel region be of a different type than the semiconductor region. There is no disclosure of this.

It is true that column 2, lines 34-36, discloses that the impurity of the second epitaxial layer 2B is opposite to that of the substrate. However, 2B is not the channel region.

On page 2 of the Official Action, in the next-to-last paragraph, it is stated that "the channel region 2B has an impurity type different from that in the substrate." However, 2B is not the channel region. See the last paragraph of the Official Action of page 2 and the first paragraph of the Official Action of page 3 that correctly identifies region 2A as the channel region and region 2B as the gate insulating film.

Attention is further directed to column 1, lines 58-62: "FIG. 1B illustrates...in which two epitaxial growth layers of... opposite conductivity to each other are formed at the channel region". If region 2B is opposite to both the substrate and region 2A, it follows that the substrate and region 2A are of the same conductivity type.

Therefore, as to Figure 1B of AOKI et al., the anticipation rejection is not believed to be viable.

The Official Action also offers Figure 5 of AOKI et al. as anticipatory.

For the recited channel region, the Official Action offers "the region underneath 9 in Figure 5" in the last two lines of the Official Action of page 5. The Official Action appears to mean that, during FET operation, a channel region will

form within substrate 1 in the region underneath 9. The Official Action offers substrate 1 as the recited semiconductor region of a second type.

Claim 1 recites "a channel region of...a **first** conductivity type being selectively provided in a semiconductor region of a **second** conductivity type...". If the channel region is formed in substrate 1 underneath 9, then the channel region and the substrate clearly have the same conductivity type.

However, the Official Action is not entirely clear on this point as, for the recited channel region, the Official Action also offers "the epitaxial doped region 9 in Figures 5" in line 3 of the Official Action of page 6. The Official Action offers substrate 1 as the recited semiconductor region of a second type.

The relative impurity types of the substrate 1 and region 9 are not disclosed. However, note that column 1, lines 49-50 discusses "an epitaxial growth layer with low impurity doping concentration is provided at the channel region" over a high impurity concentration substrate. Thus, region 9 appears to correspond to region 2A, and therefore would be of the same conductivity type as the substrate.

Claim 1 next recites that the channel region is underlying a gate insulating film. The Official Action offers

region 10 for this recitation. Region 10 is identified as gate oxide film 10 (column 3, line 31).

Claim 1 concludes by reciting that "an interface of said channel region to said gate insulating film lies at a lower level than an upper surface of said semiconductor region."

The interface between regions 9 and 10 is not at a lower level than an upper surface of the substrate. Indeed, region 9 as well as region 10 are both completely above substrate 1.

Therefore, also as to Figure 5 of AOKI et al., the anticipation rejection is not believed to be viable.

Claim 3 is not believed to be anticipated for the above-noted reasons.

Claim 8 was also rejected over AOKI et al. Figures 1 and 5. The anticipation rejection as to claim 8 is also not believed to be viable for the same reasons discussed as to claim 1.

In summary, AOKI et al. is not believed to teach the recited features of these claims. Accordingly, withdrawal of the anticipation rejection and allowance of the claims are respectfully requested.

Consider SASE next.

Claims 11-13 are said to be anticipated by SASE. Claim 12 has been cancelled and incorporated into claim 11. Claim 11

now recites a semiconductor wafer including an impurity diffused region of a first conductivity type comprising a channel region being selectively provided in a semiconductor region of a second conductivity type. The Official Action refers to Figure 3(c) and offers channel region 304 and substrate 300. Claim 11 recites an oxide film overlying said impurity diffused region, where an interface of the impurity diffused region to the oxide film lies at a lower level than an upper surface of said semiconductor wafer. The Official Action offers oxide film 303, again in Figure 3(c).

The recitation taken from claim 12 and inserted into claim 11 is that "said semiconductor region comprises a well region of the second conductivity type selectively provided in a semiconductor substrate of the first conductivity type."

SASE does not make this disclosure. It is true that SASE paragraph 0018 teaches application of his invention to other transistor applications. However, this is not anticipatory and only suggests using the teachings of SASE in other applications. What structure these teachings would result in is entirely dependent upon the method which is being modified. That structure cannot be presumed from the disclosure of SASE alone. Accordingly, the anticipation rejection is not believed to be viable.

The Official Action rejected claims 2, 4, 12, 27, 32, and 38-40 over AOKI et al. in view of VO et al.

Claims 2 and 12 first require that the recited semiconductor region comprises a well. Further, these claims require that the well region is of the second conductivity type and is provided in a semiconductor substrate of the first conductivity type.

VO et al. teach an n-well in a p-substrate. Note, however, that VO et al. also teach arsenic implantation (Figure 1f) to form an n+ region embedded in the n-well. There is no teaching of a P channel region in the n-well.

Nor is there such a teaching in AOKI et al. Thus, even if the references are combined as suggested, the recited invention does not result.

Also see that AOKI et al. teach the use of epitaxial growth layers. See column 2, lines 27-48. Therefore, if a well region were provided in the AOKI et al. device, the subsequent layers would be epitaxial growth layers grown upon the well and not within the well.

Accordingly, the rejection of claims 2 and 12 is not believed to be viable.

Claim 4 recites a well region for a depletion type lateral field effect transistor where that well region of a

second conductivity type being selectively provided in a semiconductor substrate. This is disclosed in VO et al.

The claim also recites that the well region has an upper surface and including an impurity diffused region (of a first conductivity type) which is selectively provided **in** the well region. VO et al. does not disclose this. Nor does AOKI et al.

The AOKI et al. device modified by VO et al. would have any "AOKI et al. layers" on top of the well and not in the well region as recited.

Also the modified AOKI et al. device would not meet the recitation that the upper surface of the impurity diffused region lies at a lower level than the upper surface of said well region, the impurity region being grown on top of the well region.

These comments concerning the structure of a modified AOKI et al. device also apply to the WOLF teachings.

Claims 28-29 are rejected as obvious over SASE and WOLF. SASE is offered as anticipatory except for the recited epitaxial layer of first conductivity type.

However, SASE does not disclose the recited well region. Any teaching that SASE may be applied to different transistor manufacturing applications is speculative as to the resulting structure. Accordingly, SASE falls short of anticipating the recited invention of claims 28-29.

Claims 33-36 are rejected as obvious over SASE, WOLF, and COE. SASE is offered as anticipatory except for the recited epitaxial layer of first conductivity type.

Claim 33 recites "a p-well region (5) formed in the n^--type epitaxial layer with an uppermost surface of the p-well region being co-planar with an uppermost surface of the n^--type epitaxial layer." This recitation is not anticipated as discussed above.

The claims not specifically discussed are believed to be allowable at least for depending from an allowable independent claim.

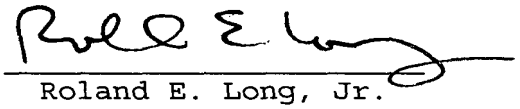
Accordingly, reconsideration and allowance of all the pending claims are respectfully requested.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. §1.16 or under 37 C.F.R. §1.17.

Respectfully submitted,

YOUNG & THOMPSON

By 

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